SONOCO PRODUCTS COMPANY (SUMNER MILL)
JUNE 2-3, 1992 CLASS II INSPECTION

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by
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ABSTRACT

A Class II Inspection was conducted at the Sonoco Products Mill (Sumner, Washington) on June 2-3, 1992. All permit parameters were well within limits during the inspection. The effluent met permit limits for BOD_5, TSS, and pH. Nitrogen and phosphorus concentrations in the effluent were limiting to further biological treatment. Sonoco effluent fecal coliform counts were relatively high (2400 - 8000/100mL), but the impact to the White River is relatively small. Most Sonoco and Ecology sample splits and analyses compared well. The exception was the Sonoco analysis of the Sonoco effluent BOD_5 sample, which was approximately half of three other effluent BOD_5 results. A number of priority pollutant and other organic compounds were detected. Other than acetone, a likely contaminant associated with sampling equipment, no VOAs were found in the effluent. Four BNA's were found in the effluent, all in concentrations below U.S. Environmental Protection Agency (EPA) water quality criteria for receiving waters. No pesticides were detected. All nine priority pollutant metals detected in the samples collected were found in concentrations less than one-third of EPA acute and chronic fresh water quality criteria. Five acute and one chronic bioassay test(s) showed no toxicity, while a second chronic test showed toxicity at 25% effluent concentration. An attempt to sample sediments was unsuccessful. The river bed appeared to be scoured.

INTRODUCTION

A Class II Inspection was conducted at the Sonoco Products Company Mill in Sumner on June 2-3, 1992. Conducting the inspection were Rebecca Inman and Steven Golding from the Washington State Department of Ecology (Ecology) Toxics, Compliance, and Ground Water Investigations Section and Don Nelson of the Ecology Industrial Section. Ken Turner, Sr. Environmental Engineer, and Forrest Ballard, Shift Supervisor, represented Sonoco and assisted during the inspection. Also, sediment collection was attempted in the White River near the mill outfall on June 3, 1992. Marc Heffner and Guy Hoyle-Dodson of Ecology carried out the effort.

Objectives of the Inspection

The inspection focused on the wastewater treatment system. An attempt was also made to collect receiving water sediments. Specific objectives included:

1. Assess WTP effluent compliance with NPDES permit limits;

2. verify NPDES permit self monitoring, split samples with the permittee to determine the comparability of sampling methods and laboratory results;

3. conduct priority pollutant scans on WTP influent and effluent to identify organic chemicals and metals;

4. assess effluent toxicity with bioassays and pollutant scans; and

5. assess impacts to receiving water sediments with chemical analyses and bioassays.

SETTING

Located in Sumner (Figure 1), the Sonoco mill re-pulps recycled cardboard and newspaper with a hydropulper to produce a daily average of 100.4 tons of unbleached paperboard. This paperboard is used for the production of liner board and core tubing.

Process wastewater is treated at the onsite wastewater treatment plant (WTP) (Figure 2). The extended aeration activated sludge WTP includes a primary clarifier, an aeration basin, and a secondary clarifier. Flow is measured by a continuous recorder/totalizer unit at a Parshall flume located downstream of the secondary clarifier. The effluent is not chlorinated. Discharge to the White River is limited by NPDES permit WA-000088-4, modified May 15, 1991. Settled solids are recycled to the mill process stream. Screenings are put in a dumpster for disposal. All sanitary sewage generated from the plant site enters the city of Sumner sewage system for treatment.

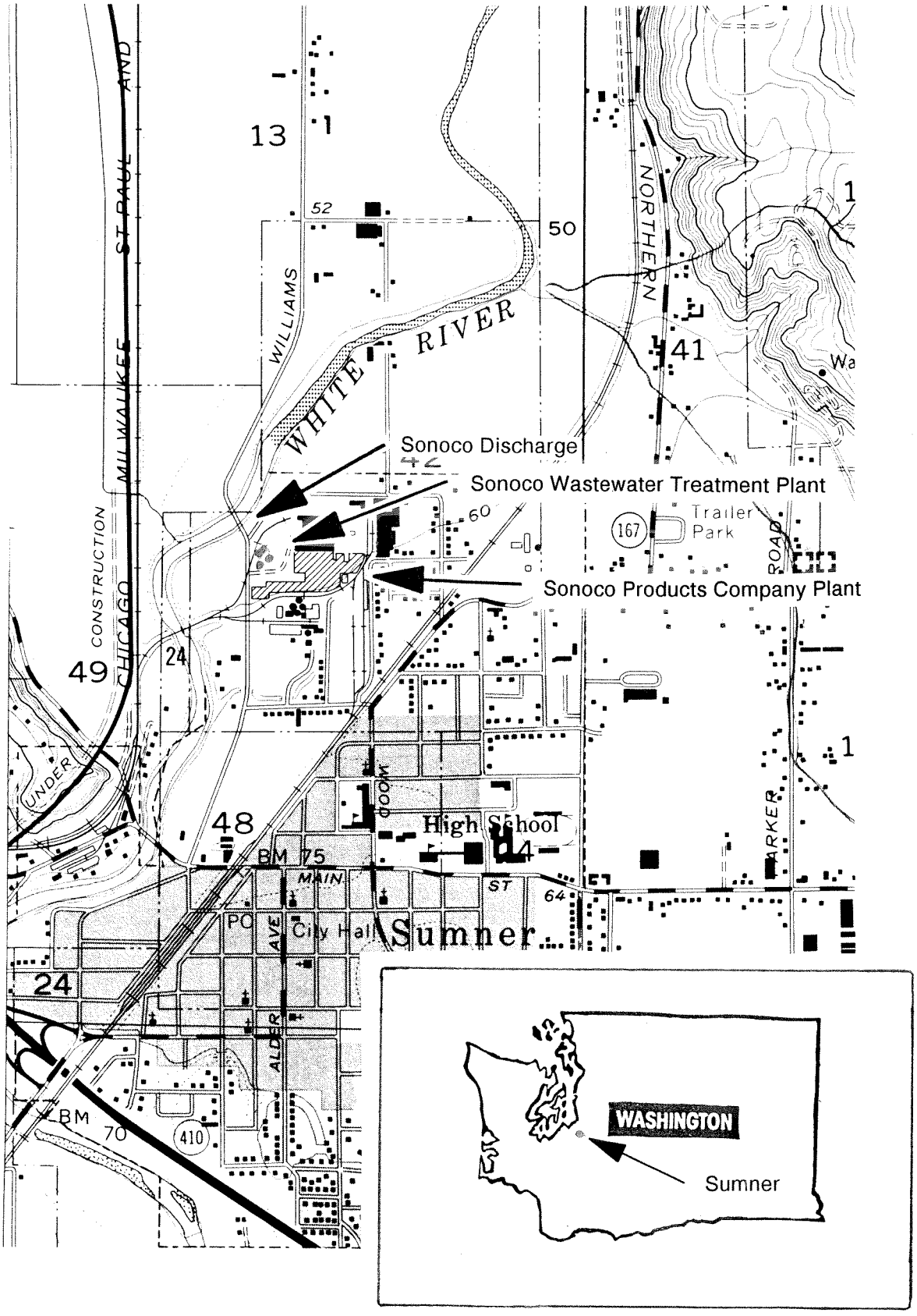

Figure 1 – Location Map – Sonoco, June 1992.

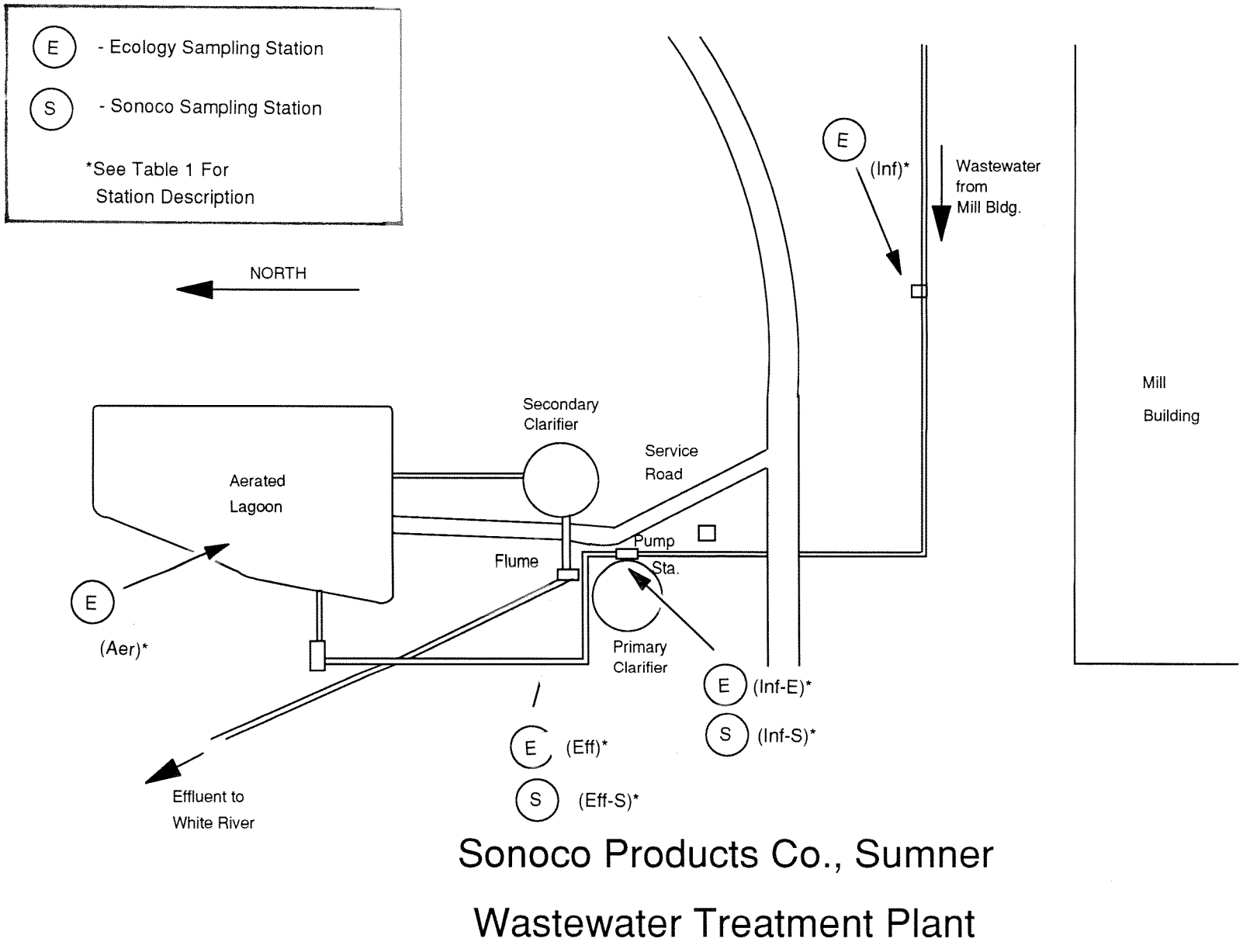

Figure 2 – Flow Schematic – Sonoco, June 1992.

PROCEDURES

Ecology collected composite and grab samples of WTP influent, aeration basin mixed liquor, and WTP effluent. In addition, an attempt was made to collect sediments near the WTP outfall in the White River.

Class II Inspection sampling included Ecology grab and composite samples. An effluent grab composite sample, consisting of two subsamples, was collected by Ecology for bioassay testing. Ecology Isco composite samplers were set up to collect equal volumes of sample every 30 minutes for 24 hours. Sampling locations are summarized in Table 1 and Figure 2. Sonoco also collected composite influent samples, which are not required by permit and were not refrigerated, and effluent samples, which were refrigerated.

All composite samples were split for both Ecology and Sonoco laboratory analysis. All samples for Ecology analysis were kept on ice and delivered to Manchester laboratory on June 3 and 4, 1992, following chain-of-custody procedures. Samples collected, sampling times, and parameters analyzed are summarized in Appendix A. A summary of analytical methods, references, and the laboratory conducting the analysis is given in Appendix B.

QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

Ecology quality assurance procedures for sampling included special cleaning of the sampling equipment prior to the inspection to prevent sample contamination (Appendix C). Chain of custody procedures were followed to assure the security of samples (Huntamer and Hyre, 1991).

Most Ecology laboratory data met Ecology QA/QC guidelines and are considered to be reliable. Those data that did not meet the guidelines are appropriately qualified on the data tables.

Chemical Oxygen Demand (COD) blanks and standards were within guidelines. Surrogate recoveries for priority pollutant organics analyses were reasonable and acceptable within quality control limits. One compound, 2-butanone, was detected in the method blank; results were qualified with a UJ where they were less than five times the concentration in the method blank. Metals spiked sample and duplicate spiked sample analysis recoveries were within acceptable limits except for aluminum and silver by ICP, and silver by AA. Matrix interferences are suspected for the silver and aluminum sample results and the N qualifier is used for the results of these two metals.

RESULTS AND DISCUSSION

Flow Measurements

Flow is measured with a Parshall flume just downstream of a holding tank. The holding tank receives piped flow from the secondary clarifier. Flow measurements from the flume were used to calculate permitted parameters in lbs/day.

Table 1 - Sampling Station Descriptions - Sonoco, June 1992.

Ecology grab influent samples (Inf)

The samples were collected from a sampling station intercepting the mill wastewater line adjacent to the mill building.

Ecology composite influent sample (Inf-E)

The sample was collected in the WTP influent pump wet well, downstream of the bar screen. The sample intake was placed six feet below the wet well cover, 1½ feet above the floor of the wet well.

Sonoco composite influent sample (Inf-S)

The sample was collected in the WTP influent pump wet well, downstream of the bar screen. The sample intake was suspended in the wet well.

Aerated lagoon (Aer)

Samples were collected from a well mixed portion of the aerated lagoon.

Ecology effluent sampled (Eff)

Grab and composite samples were collected from a 4½ foot deep holding tank upstream of the Parshall flume. Composite samples were collected at mid-depth, near the center of the tank.

Sonoco composite sample (Eff-S)

The sample was collected from the holding tank upstream of the Parshall flume. The sample intake was suspended in the tank.

The three-inch flume was inspected and flume configuration was verified to be acceptable. Ecology made a flow measurement for comparison with Sonoco flow meter measurements by taking readings of water depth twice per minute for ten minutes. The plant flow meter measurement read 26% higher than Ecology's measurement. Water depth oscillated during the measurement period to a degree sufficient to account for the difference in measurements. Individual measurements made by Ecology varied from three to five inches. Plant personnel attribute the cyclic flow to the operation of the pump from the aeration basin.

The uneven flow through the Parshall flume may be the result of a periodic air lock in the submerged outlet weir of the secondary clarifier. The submerged weir was considerably off-level and bent. The unlevel submerged weir may possibly reduce the accuracy of the Sonoco effluent flow meter, as well as reducing clarifier efficiency. The weir should be straightened and leveled to provide for an even contribution of flow around the clarifier.

NPDES Permit Compliance/General Chemistry

The WTP was performing well during the inspection. The conventional parameters of BOD_5, TSS and pH indicate a well treated effluent (Table 2). All permit parameters were well within limits during the inspection (Table 3). BOD_5 was 13% of daily maximum limits and 25% of monthly average limits. TSS was 5% of daily maximum limits and 9% of monthly average limits. Ecology BOD_5, COD, and TOC results are consistent with expected results for influent and effluent (Table 3).

As a general rule, the ratio of BOD_5 to inorganic nitrogen required for biological treatment has been established as 20:1 and BOD_5 to total phosphorus as 100:1 (WPCF, 1977). The WTP influent BOD_5 (632 mg/L) and total inorganic nitrogen (NO_2 + NO_3 + NH_3 - 0.083 mg/L) ratio was 7600:1. The ratio for BOD_5 and phosphorus was 290:1. The ratios for BOD_5 to both inorganic nitrogen and phosphorus indicate the need for the addition of both nutrients to the influent. Sonoco adds urea and phosphorus to the influent downstream of the influent sampling points.

Concentrations of NH_3-N, NO_3-N, and NO_2-N in the effluent were low, indicating that nitrogen may be limiting to BOD reduction even with Sonoco's additions of urea. The ratio of effluent BOD_5 to total inorganic nitrogen was 1700:1. Total persulfate nitrogen was high in the effluent, but is representative of an organic form of nitrogen not available to the biochemical processes of the treatment plant. The ratio for effluent BOD_5 to phosphorus was 140:1. Nutrient concentrations should be evaluated if plant upsets occur or improved effluent quality becomes necessary. Before increasing nutrient additions, consideration should be given to effluent ammonia or nutrient concentrations with respect to aquatic life criteria or future nutrient criteria.

Fecal coliform counts for effluent samples ranged from 2400 to 8000/100mL. Washington water quality standards specify a geometric mean value of 100 colonies/100mL for the receiving water (Ecology, 1992a). The White River at Sumner has had fecal coliform counts in excess of fecal

Table 2 – General Chemistry Results – Sonoco, June 1992.

Parameter	Location:	Trns Blnk	Inf–1	Inf–2	Inf–3	Inf–E	Inf–S	Aer–1	Aer–2	Eff–1	Eff–2	Eff–3
	Type:	grab	grab	grab	grab	E–comp	S–comp	grab	grab	grab	grab	grab
	Date:	6/2	6/2	6/2	6/3	6/2–3	6/2–3	6/2	6/2	6/2	6/2	6/2
	Time:	1100	1050	1420	1300	1100	1115	1110	1500	1120	1445	1305
	Lab Log #:	238080	238081	238082	238095	238083	238084	238085	238086	238087	238088	238096
GENERAL CHEMISTRY												
Conductivity (umhos/cm)			1410	1360		1470	1460J			1560	1540	
Alkalinity (mg/L CaCO3)						618						
Hardness (mg/L CaCO3)						296						
Color						175E*						
Grain Size (% phi size)												
TS (mg/L)						2150	3300					
TNVS (mg/L)						963	1570					
TSS (mg/L)						500	1980	1280	1300			
TNVSS (mg/L)						90	780	333	350			
% Solids												
% Volatile Solids												
BOD5 (mg/L)						632						
COD (mg/L)						1500						
TOC (water mg/L)						454						
Total Persulfate N(TPN) (mg/L)						0.058						
NH3–N (mg/L)						0.054						
NO2+NO3–N (mg/L)						0.029						
Total–P (mg/L)						2.18						
Oil and Grease (mg/L)										2	2	
F–Coliform MF (#/100mL)										4300	2400	
F–Coliform MPN (#/100mL)										8000	5000	
Cyanide total (ug/L)			36	42						26	26	
Cyanide (wk & dis ug/L)			2	2						2	2	
Phenolics Total(water–mg/L)					0.189**							0.0174**
FIELD OBSERVATIONS												
Temperature (C)			27.5	26.4				23.5	24.7	22.9	24.5	
Temp–cooled (C)						8.6	17.3					
pH			7.8	7.7		7.8	7.6	8.0	8.1	8.1	8.3	
Conductivity (umhos/cm)			1280	590			1250	510	1325	750	1335	

Trns Blk – transfer blank
Inf – influent to the WTP
Aer – aeration basin
Eff – effluent
grab – grab sample
comp – composite sample
C – composite sample
E – sample collected by Ecology
S – sample collected by Sonoco

E* – estimated result

** Phenolics were sampled as grabs because insufficient sample was available from composite samplers.

Table 2 – (cont'd) – Sonoco, June 1992.

Parameter II	Locatn:	Eff–E	Eff–S	Eff–GC	
	Type:	E–comp	S–comp	grab–comp	
	Date:	6/2–3	6/2–3	6/2	Percent
	Time:	1015	1040	1140	Reduction
	Lab Log #:	238089	238090	238091	Inf to Eff
GENERAL CHEMISTRY					
Conductivity (umhos/cm)		1530		1550	–4
Alkalinity (mg/L CaCO3)		747		761	–21
Hardness (mg/L CaCO3)		321		328	–8
Color		400			
Grain Size (% phi size)					
TS (mg/L)		1320			39
TNVS (mg/L)		867			10
TSS (mg/L)		46			91
TNVSS (mg/L)		8			91
% Solids					
% Volatile Solids					
BOD5 (mg/L)		86	83		86
COD (mg/L)		360			76
TOC (water mg/L)		132	121		71
Total Persulfate N(TPN) (mg/L)		1.32			–2176
NH3–N (mg/L)		0.051			6
NO2+NO3–N (mg/L)		0.01U			
Total–P (mg/L)		0.601			72
Oil and Grease (mg/L)					
F–Coliform MF (#/100mL)					
F–Coliform MPN (#/100mL)					
Cyanide total (ug/L)					
Cyanide (wk & dis ug/L)					
Phenolics Total(water–mg/L)					
FIELD OBSERVATIONS					
Temperature (C)					
Temp–cooled (C)		8.7	9.7		
pH		8.2	8.3		
Conductivity (umhos/cm)		1370	1120		

Table 3 – NPDES Permit Limits and Inspection Results – Sonoco, June 1992.

	NPDES Limits		Inspection Results	
Parameter	Monthly Average	Daily Maximum	Composite Samples	Grab Samples
BOD5	348 lbs/day	673 lbs/day	86 mg/L 142 lbs/day	
TSS	486 lbs/day	957 lbs/day	46 mg/L 76 lbs/day	
pH	5.0 to 9.0			8.1; 8.3
Flow	--	--	198,100 gpd *	
Production	--	--	110.8 tons/day**	

* flow corrected to 24-hours as recorded from Sonoco flow meter from 1000, 6-2-92 to 1015, 6-3-92

** total production reported by Sonoco for 6-2-92

coliform standards (Ecology, 1992b). From the period 1978 - 1991 the standard of 100 colonies/100mL (geometric mean) has been exceeded for March, June, July, and November data at river mile 0.7, which is downstream of the Sonoco discharge. Single samples collected in six of eleven months in 1991 exceeded 100 fecal coliforms/100mL (Ecology, 1993).

Assuming a maximum size mixing zone of 25% of stream flow, in accordance with the water quality standards, Sonoco contributed 5 colonies/100mL at the edge of the mixing zone during average river flow (1 colony/100mL after complete mixing with the river). A plant discharge rate equal to that at the time of the inspection (a period of full production) was also assumed. For a 25% mixing zone and 7-day 10-year low flow conditions (433 cfs - Pelletier, 1992), the Sonoco contribution to fecal coliform counts on the River at low flow is 14/100mL (3/100mL after complete mixing). This is a relatively small but significant contribution to the fecal coliform concentration in the receiving water.

Fecal coliform concentrations of between 1800/100mL and 50000/100mL were found in a previous study of Sonoco effluent, suggesting that at times Sonoco contributes a higher number of fecal coliform to the White River (Pelletier, 1992). The study found between 47% and 100% *Klebsiella*. Although *Klebsiella* have been considered benign, they may in some cases be pathogenic. Some forms of *Klebsiella* found in wood wastes are identical to those which cause pneumonia in humans (Vasconcelos, 1993).

Split Sample Comparison

Ecology composite samples were split for Ecology and Sonoco analysis. Inf-S, the Sonoco influent composite sample, was unrefrigerated. For this reason Ecology analyzed Inf-S for conductivity and solids parameters only. Because only a small amount of Eff-S (the Sonoco effluent composite sample) was available, Ecology analyzed Eff-S for BOD_5 and total organic carbon (TOC) only.

Most sample splits compare well (Table 4). Three of four BOD_5 analyses by Sonoco and Ecology compare closely. The Sonoco analysis of the Sonoco effluent sample was the exception, yielding a BOD_5 result approximately half of the other three results (Table 4). Since Ecology analyses of Sonoco and Ecology samples were in good agreement, the analysis of the Sonoco effluent sample and not the sample itself appears to be responsible for the variance.

Though a composite influent sample is not required by permit, Ecology analyses resulted in 1980 mg/L TSS for the Sonoco sample (Inf-S), compared with 500 mg/L TSS for the Ecology sample (Inf-E). Other solids results showed similar differences between the two samples (Table 2). The difference may be a result of nonrepresentative sampling at the Sonoco influent sample point or of biological growth in the unrefrigerated sample collection container. Effluent TSS samples collected by Sonoco and Ecology compare closely.

The Sonoco laboratory was audited by Ecology's Quality Assurance Section on July 28, 1992, and accredited by Ecology on September 13, 1992.

Table 4 – Split Sample Results Comparison – Sonoco, June 1992.

	Location:	Inf–E	Inf–S	Eff–E	Eff–S	Eff
	Type:	E–comp	S–comp	E–comp	S–comp	Eff–grab
	Date:	6/2–3	6/2–3	6/2–3	6/2–3	6/2
	Time:	1100	1115	1015	1040	
	Lab Log #:	238083	238084	238089	238090	
	Sampled by:	Ecology	Sonoco	Ecology	Sonoco	
Parameter						
	Analysis by:					
BOD5 (mg/L)						
	Ecology	632	*	86	83	
	Sonoco	590	*	73	39	
TSS (mg/L)						
	Ecology	500	1980	46	--	
	Sonoco	492	*	44	53	
pH						
	Ecology					8.12; 8.27

* Sonoco analyzes influent composite sample for pH only. Because the sample is unrefrigerated, Ecology did not analyze for BOD.

Priority Pollutant Scans

Six VOA organics were detected in the influent samples collected (Table 5). The compounds detected in the highest concentrations in the influent were acetone (81- 130 μg/L), and toluene (3.2- 9.3 μg/L). The compound 2-Butanone was detected at 24 μg/L but the analyte was also detected in the method blank. Acetone was the only VOA organic detected in the effluent (37-21 μg/L). Acetone was used for laboratory cleaning of beakers used for VOA sampling and is not likely representative of the influent.

Ten BNA organics were detected in the influent samples collected. Of the compounds detected in the influent sample, benzoic acid was found in the highest concentration (200 μg/L).

Four BNA compounds were detected in the effluent. Of these, benzoic acid was found in the highest concentration (12 μg/L). Bis(2-ethylhexyl)phthalate in the effluent was found at 83% of the EPA chronic fresh water quality criteria, but less than 1% of EPA acute fresh water quality criteria (Table 5 - EPA, 1986). All other organics detected in the effluent were well below EPA water quality criteria. No pesticides were detected in the influent or effluent samples.

All of the nine priority pollutant metals detected in the effluent samples collected were found in concentrations less than one-third of EPA acute and chronic fresh water quality criteria (Table 5 - EPA, 1986). A complete list of parameters analyzed and analytical results is included in Appendix D.

A number of Tentatively Identified Compounds (TICs) were found in the influent samples at concentrations up to 470 μg/L (est.). TICs were found in the effluent samples at concentrations of up to 460 μg/L (est.). Appendix E summarizes TICs found.

Bioassays

Most acute and chronic bioassays of Sonoco effluent showed no adverse effects (Table 6). The fathead minnow growth test (a chronic bioassay) was the exception. The test showed a 12.5% No Observable Effects Concentration (NOEC), corresponding to a 25% Lowest Observable Effects Concentration (LOEC).

Sediments

An attempt was made to collect sediments 20 feet upstream of the diffuser, 50 feet upstream, and just downstream of the diffuser. No sediments were recovered. The swift river current appears to have scoured the river bed of sediments. Since the inspection, a diver hired by Sonoco to inspect the diffuser was also unable to collect sediment samples (Nelson, 1993).

Table 5 – VOA, BNA, Pesticide/PCB and Metals Scan Results – Sonoco, June 1992.

Location:	Inf–1	Inf–2	Eff–1	Eff–2	EPA Water Quality Criteria Summary	
Type:	grab	grab	grab	grab		
Date:	6/2	6/2	6/2	6/2	Acute Fresh	Chronic Fresh
Time:	1050	1420	1120	1445		
Lab Log#:	238081	238082	238087	238088		
VOA Compounds	ug/L	ug/L	ug/L	ug/L	(ug/L)	(ug/L)
Acetone	81++	130++	37++	21++		
Carbon Disulfide	1.0 U	1.0 J	1.0 U	1.0 U		
2–Butanone (MEK)	13 UJ	24 B	5.0 U	5.0 U		
1,1,1–Trichloroethane	2.7	3.5	1.0 U	1.0 U	18,000 *(c)	
Toluene	3.2	9.3	1.0 U	1.0 U	17,500 *	
1,1,2–Trichloro–1,2,2–Trifluoroethane (Freon 113)	2.0	2.0 U	2.0 U	2.0 U		

Location:	Inf–E	Eff–E	EPA Water Quality Criteria Summary	
Type:	E–comp	E–comp		
Date:	6/2–3	6/2–3	Acute Fresh	Chronic Fresh
Time:	1000–1000	1000–1000		
Lab Log#:	238083	238089		
BNA Compounds	ug/L	ug/L	(ug/L)	(ug/L)
Phenol	31	2 U	10,200 *	2,560 *
Benzyl Alcohol	11 J	5 U		
4–Methylphenol	15 J	1 U		
Isophorone	3.0 J	1.7 J	117,000 *	
Benzoic Acid	200	12		
Naphthalene	3.7 J	1 U	2,300 *	620 *
Diethyl Phthalate	22	1 U	940 *(i)	3 *(i)
Pentachlorophenol	20 U	0.9 J	20 **	13 **
Di–n–Butyl Phthalate	12	1 U	940 *(i)	3 *(i)
Butylbenzyl Phthalate	4.8 J	1 U	940 *(i)	3 *(i)
Bis(2–Ethylhexyl)Phthalate	17	2.5	940 *(i)	3 *(i)
Pesticide/PCB Compounds	ug/L	ug/L		

(none detected)

Inf – influent to the WTP
Eff – effluent
grab – grab sample
E – sample collected by Ecology

++ apparent contamination from the cleaning of sampling equipment

U – Indicates the analyte was not detected at or above the reported result.
J – Indicates an estimated value for a detected analyte.
B – Indicates the analyte was also found in the analytical method blank indicating the sample may have been contaminated.
UJ – Indicates the analyte was not detected at or above the reported estimated result.

Table 5 – (cont'd) – Sonoco, June 1992.

	Location:	Inf-E	Eff-E	EPA Water Quality Criteria Summary	
	Type:	E-comp	E-comp		
	Date:	6/2-3	6/2-3	Acute	Chronic
	Time:	1000-1000	1000-1000	Fresh	Fresh
	Lab Log#:	238083	238089		
Metals (total)	Hardness = 320	ug/L	ug/L	(ug/L)	(ug/L)
Aluminum		5310 N	1080 N		
Antimony		30 U	30 U	9,000 *	1,600 *
Arsenic		4.1 P	4.4 P		
Pentavalent				850 *	48 *
Trivalent				360	190
Beryllium		1.0 U	1.0 U	130 *	5.3 *
Cadmium		1.09	0.34 P	14.6 +	2.8 +
Chromium		6.3 P	5.0 U		
Hexavalent				16	11
Trivalent				4,502 +	537 +
Copper		35.8	7.9 P	53 +	32 +
Lead		18.0	4.6 P	359 +	14.0 +
Mercury		0.28 P	0.084 P	2.4	0.012
Nickel		11 P	11 P	3,794 +	422 +
Selenium		2.0 U	5.0 P	260	35
Zinc		270	76.3	314 +	284 +

[1]NOTE: SOME INDIVIDUAL COMPOUND CRITERIA OR LOELS MAY NOT AGREE WITH GROUP CRITERIA OR LOELS. REFER TO APPROPRIATE EPA DOCUMENT ON AMBIENT WATER QUALITY CRITERIA FOR FULL DISCUSSION.

Inf – influent to the WTP
Eff – effluent
comp – composite sample
E – sample collected by Ecology

P – indicates the analyte was detected above the instrument detection limit but below the established minimum quantitation limit.
U – Indicates the analyte was not detected at or above the reported result.
N – indicates the spike sample recovery is not within control limits.

* Insufficient data to develop criteria. Value presented is the LOEL – Lowest Observed Effect Level.
\+ Hardness dependent criteria (320 mg/L used).
c Total Trichloroethanes
i Total Phthalate Esters

Table 6 – Effluent Bioassay Results – Sonoco, June 1992.

Ceriodaphnia dubia - chronic survival and reproduction
(Ceriodaphnia dubia)

Sample No. 238091

Sample Concentration	# Tested	Avg # Young Per Adult	Percent Survival
0 % effluent	10	9.0	80
6.25 % effluent	8	53.8	100
12.5 % effluent	8	55.8	100
25 % effluent	10	50.3	90
50 % effluent	10	48.5	100
100 % effluent	10	14.4	80

Chronic	Acute
NOEC = 100% effluent	NOEC = 100% effluent
	LC50>100%

Daphnia magna - 48-hour survival test
(Daphnia magna)

Sample No. 238091

Sample Concentration	# Tested	Percent Survival
0 % effluent	20	100
6.25 % effluent	20	100
12.5 % effluent	20	100
25 % effluent	20	100
50 % effluent	20	100
100 % effluent	20	100

NOEC = 100% effluent
LC50>100%

Fathead larval survival and growth test
(Pimephales promelas)

Sample No. 238091

Sample Concentration	Avg. Weight	Percent Survival
0 % effluent	0.47	100
6.25 % effluent	0.51	97
12.5 % effluent	0.45	100
25 % effluent	0.33	94
50 % effluent	0.18	92
100 % effluent	0.23	92

Chronic	Acute
NOEC = 12.5% effluent	NOEC = 100% effluent
LOEC = 25% effluent	LC50>100%

Table 6 – (cont'd) – Sonoco, June 1992.

Fathead minnow acute test
(Pimephales promelas)

Sample No. 238091

Sample Concentration	#Tested	% Survival
0	20	100
12.5	20	100
25	20	95
50	20	95
100	20	95

NOEC = 100% effluent
LC50>100%

Rainbow Trout - 96-hour survival test
(Oncorhynchus mykiss)

Sample No. 238091

Sample Concentration	# Tested	% Survival
0 % effluent	30	100
65 % effluent	30	100

NOEC - no observable effects concentration
LC50 - lethal concentration for 50% of the organisms
LOEC - lowest observable effects concentration

RECOMMENDATIONS AND CONCLUSIONS

Flow

Water depth in the Parshall flume oscillated considerably. The operation of the pump from the aeration basin may be responsible for the oscillation. A cyclic air lock in the submerged outlet weir of the secondary clarifier, which is bent and considerably off-level may be responsible. A submerged weir which is not level may reduce effluent flow meter accuracy as well as reducing clarifier efficiency.

- The submerged weir should be made straight and level to provide for an even contribution of flow around the clarifier.

NPDES Permit Compliance/General Chemistry

All permit parameters were well within limits during the inspection. Although Sonoco adds urea and phosphorus to the influent, low nitrogen and phosphorus concentrations in the effluent may indicate that nutrients are limiting to further BOD reduction.

- Low nitrogen and phosphorus concentrations may not be a concern at present since the discharge met permit limits. Nutrient concentrations should be evaluated if plant upsets occur or improved effluent quality becomes necessary. Before increasing additions of nutrients, consideration should be given to effluent ammonia or nutrient concentrations with respect to water quality criteria.

Although fecal coliform counts in the Sonoco effluent were high, Sonoco's contribution of fecal coliform to the White River was relatively small during the inspection. Previous data indicates that Sonoco's contribution may be higher at times, however.

Split Sample Comparison

Most sample splits compared well. The Sonoco analyses of the Sonoco effluent BOD_5 sample was the exception with a result approximately half of that of the other effluent BOD_5 results.

Although a composite influent sample is not required by permit, a large difference in influent samples collected by Sonoco and Ecology may be a result of nonrepresentative sampling at the Sonoco influent sample point and/or growth in the unrefrigerated sample collection container.

Priority Pollutant Scans

All VOA and BNA compounds and metals detected in the effluent were at concentrations less than EPA acute and chronic fresh water quality toxicity criteria.

Bioassays

Most acute and chronic bioassays of Sonoco effluent showed no adverse effects. The fathead minnow growth test (a chronic bioassay) was the exception with reductions in growth rate at 25% effluent.

Sediments

An unsuccessful attempt was made to collect sediments. The swift river current appears to have scoured the river bed of sediments.

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APPENDICES

Appendix A – Sampling Schedule – Sonoco, June 1992.

Parameter	Location:	Trns Blnk	Inf–1	Inf–2	Inf–E	Inf–S	Aer–1	Aer–2	Eff–1	Eff–2
	Type:	grab	grab	grab	E–comp	S–comp	grab	grab	grab	grab
	Date:	6/2	6/2	6/2	6/2–3	6/2–3	6/2	6/2	6/2	6/2
	Time:									
	Lab Log #:									
GENERAL CHEMISTRY										
Conductivity			E	E	E	E			E	E
Alkalinity					E					
Hardness					E					
Color					E					
TS					E	E				
TNVS					E	E				
TSS					ES	E	E	E		
TNVSS					E	E	E	E		
BOD5					ES					
COD					E					
TOC (water)					E					
Total Persulfate N					E					
NH3–N					E					
NO2+NO3–N					E					
Total–P					E					
Oil and Grease (water)									E	E
F–Coliform MF									E	E
F–Coliform MPN									E	E
Cyanide (total)			E	E					E	E
Cyanide (wk & dis)			E	E					E	E
Cyanide (wk & dis soil/sed)										
ORGANICS										
VOC (water)			E	E					E	E
VOC (soil/sed)										
BNAs (water)					E					
BNAs (soil/sed)										
Pest/PCB (water)					E					
Pest/PCB (soil/sed)										
Phenolics Total(water)					E					
METALS										
PP Metals (water)		E			E					
PP Metals (soil/sed)										
Aluminum		E			E					
BIOASSAYS										
Salmonid (acute 65%)										
Daphnia magna (acute)										
Ceriodaphnia (chronic)										
Fathead Minnow (acute)										
Fathead Minnow (chronic)										
Hyallela (solid acute)										
Microtox (solid acute)										
FIELD OBSERVATIONS										
Temperature			E	E			E	E	E	E
Temp–cooled*+					E	E				
pH			E	E	E	E	E	E	E	E
Conductivity			E	E		E	E	E	E	E
Chlorine									E	E
Sulfide										

E–comp – composite sample collected by Ecology
S–comp – composite sample collected by Sonoco
E – Ecology analysis
S – Sonoco analysis
grab – grab sample
comp – composite sample

GC – grab–composite sample
Inf – influent
Aer – aerated lagoon sample
Eff – effluent
Trns Blnk – transfer blank

Appendix A – (cont'd) – Sonoco, June 1992.

Parameter II	Locatn:	Eff–E	Eff–S	Eff–GC
	Type:	E–comp	S–comp	grab–comp
	Date:	6/2–3	6/2–3	6/2
	Time:			
	Lab Log #:			
GENERAL CHEMISTRY				
Conductivity		E		E
Alkalinity		E		E
Hardness		E		E
Color		E		
		E		
		E		
TSS		S		
TNVSS		E		
BOD5		ES	ES	
COD		E		
TOC (water)		E	E	
Total Persulfate N		E		
NH3–N		E		
NO2+NO3–N		E		
Total–P		E		
Oil and Grease (water)				
F–Coliform MF				
F–Coliform MPN				
Cyanide (total)				
Cyanide (wk & dis)				
Cyanide (wk & dis soil/sed)				
ORGANICS				
VOC (water)				
VOC (soil/sed)				
BNAs (water)		E		
BNAs (soil/sed)				
Pest/PCB (water)		E		
Pest/PCB (soil/sed)				
Phenolics Total(water)		E		
METALS				
PP Metals (water)		E		
PP Metals (soil/sed)				
Aluminum		E		
BIOASSAYS				
Salmonid (acute 65%)				E
Daphnia magna (acute)				E
Ceriodaphnia (chronic)				E
Fathead Minnow (acute)				E
Fathead Minnow (chronic)				E
Hyallela (solid acute)				
Microtox (solid acute)				
FIELD OBSERVATIONS				
Temperature				
Temp–cooled*+		E	E	
pH		E	E	
Conductivity		E	E	
Chlorine				
Sulfide				

Appendix B – Ecology Analytical Methods – Sonoco, June 1992.

Laboratory Analysis	Method Used for Ecology Analysis	Lab Used: Laboratory Performing Analysis
Conductivity	EPA, Revised 1983: 120.1	Ecology Manchester Laboratory
Alkalinity	EPA, Revised 1983: 310.1	Ecology Manchester Laboratory
Hardness	EPA, Revised 1983: 130.2	Ecology Manchester Laboratory
Color	EPA, Revised 1983: 110.1	Ecology Manchester Laboratory
TS	EPA, Revised 1983: 160.3	Ecology Manchester Laboratory
TNVS	EPA, Revised 1983: 106.3	Ecology Manchester Laboratory
TSS	EPA, Revised 1983: 160.2	Ecology Manchester Laboratory
TNVSS	EPA, Revised 1983: 106.2	Ecology Manchester Laboratory
BOD5	EPA, Revised 1983: 405.1	Ecology Manchester Laboratory
COD	EPA, Revised 1983: 410.1	Ecology Manchester Laboratory
TOC (water)	EPA, Revised 1983: 415.1	Ecology Manchester Laboratory
Total Persulfate N	EPA, Revised 1983: 351.3	Ecology Manchester Laboratory
NH3-N	EPA, Revised 1983: 350.1	Ecology Manchester Laboratory
NO2+NO3-N	EPA, Revised 1983: 353.2	Ecology Manchester Laboratory
Total-P	EPA, Revised 1983: 365.3	Ecology Manchester Laboratory
Oil and Grease (water)	EPA, Revised 1983: 413.1	Ecology Manchester Laboratory
F-Coliform MF	APHA, 1989: 9222D.	Ecology Manchester Laboratory
F-Coliform MPN	APHA, 1989: 9221C.	Ecology Manchester Laboratory
Cyanide (total)	EPA, Revised 1983: 335.2	Ecology Manchester Laboratory
Cyanide (wk & dis)	APHA, 1989: 4500-CNI.	Ecology Manchester Laboratory
VOC (water)	EPA, 1988: 8260	Ecology Manchester Laboratory
BNAs (water)	EPA, 1986: 8270	Analytical Resources Inc.
Pest/PCB (water)	EPA, 1986: 8080	Analytical Resources Inc.
Phenolics Total(water)	EPA, Revised 1983: 420.2	Ecology Manchester Laboratory
PP Metals (water)	EPA, Revised 1983: 200-299	Ecology Manchester Laboratory
Total aluminum	EPA, Revised 1983: 200.7/6010	Ecology Manchester Laboratory
Salmonid (acute 65%)	Ecology, 1991.	Ecology Manchester Laboratory
Daphnia magna (acute)	EPA 1991	Ecology Manchester Laboratory
Ceriodaphnia (chronic)	EPA 1989: 1002.0	Ecology Manchester Laboratory
Fathead Minnow (acute)	EPA 1991	Ecology Manchester Laboratory
Fathead Minnow (chronic)	EPA 1989: 1000.0	Ecology Manchester Laboratory

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Appendix C - Priority Pollutant Cleaning and Field Transfer Blank Procedures - Sonoco, Sumner.

PRIORITY POLLUTANT SAMPLING EQUIPMENT CLEANING PROCEDURES

1. Wash with laboratory detergent;
2. Rinse several times with tap water;
3. Rinse with 10% HNO_3 solution;
4. Rinse three (3) times with distilled/deionized water;
5. Rinse with high purity methylene chloride;
6. Rinse with high purity acetone; and
7. Allow to dry and seal with aluminum foil.

FIELD TRANSFER BLANK PROCEDURE

1. Pour organic free water directly into appropriate bottles for parameters to be analyzed from grab samples (VOA).

2. Run approximately 1L of organic free water through a compositor and discard.

3. Run approximately 6L of organic free water through the same compositor and put the water into appropriate bottles for parameters to be analyzed from composite samples (BNA, Pesticide/PCB, resin acids, guaiacols, dioxins, phenolics, and metals).

Appendix D – VOA, BNA, Pesticide/PCB and Metals Scan Results – Sonoco, June 1992.

Location:	Trns Blnk	Inf–1	Inf–2	Inf–E	Eff–E	Eff–1	Eff–2
Type:	grab	grab	grab	E–comp	E–comp	grab	grab
Date:	6/2	6/2	6/2	6/2–3	6/2–3	6/2	6/2
Time:	1100	1050	1420	1000–1000	1000–1000	1120	1445
Lab Log#:	238080	238081	238082	238083	238089	238087	238088
VOA Compounds	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Chloromethane		2.0 U	2.0 U			2.0 U	2.0 U
Bromomethane		2.0 U	2.0 U			2.0 U	2.0 U
Vinyl Chloride		2.0 U	2.0 U			2.0 U	2.0 U
Chloroethane		2.0 U	2.0 U			2.0 U	2.0 U
Methylene Chloride		2.0 U	2.0 U			2.0 U	2.0 U
Acetone		81	130			37	21
Carbon Disulfide		1.0 U	1.0 J			1.0 U	1.0 U
1,1–Dichloroethene		1.0 U	1.0 U			1.0 U	1.0 U
1,1–Dichloroethane		1.0 U	1.0 U			1.0 U	1.0 U
trans–1,2–Dichloroethene		1.0 U	1.0 U			1.0 U	1.0 U
cis–1,2–Dichloroethene		1.0 U	1.0 U			1.0 U	1.0 U
Chloroform		1.0 U	1.0 U			1.0 U	1.0 U
1,2–Dichloroethane		1.0 U	1.0 U			1.0 U	1.0 U
2–Butanone (MEK)		13 UJ	24 B			5.0 U	5.0 U
1,1,1–Trichloroethane		2.7	3.5			1.0 U	1.0 U
Carbon Tetrachloride		1.0 U	1.0 U			1.0 U	1.0 U
Vinyl Acetate		1.0 U	1.0 U			1.0 U	1.0 U
Bromodichloromethane		1.0 U	1.0 U			1.0 U	1.0 U
1,2–Dichloropropane		1.0 U	1.0 U			1.0 U	1.0 U
cis–1,3–Dichloropropene		1.0 U	1.0 U			1.0 U	1.0 U
Trichloroethene		1.0 U	1.0 U			1.0 U	1.0 U
Dibromochloromethane		1.0 U	1.0 U			1.0 U	1.0 U
1,1,2–Trichloroethane		1.0 U	1.0 U			1.0 U	1.0 U
Benzene		1.0 U	1.0 U			1.0 U	1.0 U
trans–1,3–Dichloropropene		1.0 U	1.0 U			1.0 U	1.0 U
2–Chloroethylvinyl Ether		1.0 U	1.0 U			1.0 U	1.0 U
Bromoform		1.0 U	1.0 U			1.0 U	1.0 U
4–Methyl–2–Pentanone (MIBK)		5.0 U	5.0 U			5.0 U	5.0 U
2–Hexanone		5.0 U	5.0 U			5.0 U	5.0 U
Tetrachloroethene		1.0 U	1.0 U			1.0 U	1.0 U
1,1,2,2–Tetrachloroethane		1.0 U	1.0 U			1.0 U	1.0 U
Toluene		3.2	9.3			1.0 U	1.0 U
Chlorobenzene		1.0 U	1.0 U			1.0 U	1.0 U
Ethylbenzene		1.0 U	1.0 U			1.0 U	1.0 U
Styrene		1.0 U	1.0 U			1.0 U	1.0 U
Total Xylenes		2.0 U	1.0 U			2.0 U	2.0 U
Trichlorofluoromethane		2.0 U	2.0 U			2.0 U	2.0 U
1,1,2–Trichloro–1,2,2–Trifluoroethane (Freon 113)		2.0	2.0 U			2.0 U	2.0 U

Trns Blk – transfer blank
Inf – influent to the WTP
Eff – effluent
grab – grab sample
C – composite sample
E – sample collected by Ecology

U – Indicates compound was analyzed for but not detected at the given detection limit.
J – Indicates an estimated value for a detected analyte.
UJ – Indicates the analyte was not detected at or above the reported estimated result.
B – Indicates the analyte was also found in the analytical method blank indicating the sample may have been contaminated.

Appendix D – (cont'd) – Sonoco, June 1992.

Location:	Trns Blnk	Inf-1	Inf-2	Inf-E	Eff-E	Eff-1	Eff-2
Type:	grab	grab	grab	E-comp	E-comp	grab	grab
Date:	6/2	6/2	6/2	6/2-3	6/2-3	6/2	6/2
Time:	1100	1050	1420	1000-1000	1000-1000	1120	1445
Lab Log#:	238080	238081	238082	238083	238089	238087	238088
BNA Compounds	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Phenol				31	2 U		
Bis(2-Chloroethyl)Ether				4 U	1 U		
2-Chlorophenol				4 U	1 U		
1,3-Dichlorobenzene				4 U	1 U		
1,4-Dichlorobenzene				4 U	1 U		
Benzyl Alcohol				11 J	5 U		
1,2-Dichlorobenzene				4 U	1 U		
2-Methylphenol				4 U	1 U		
2,2 -Oxybis(1-Chloropropane)				4 U	1 U		
4-Methylphenol				15 J	1 U		
N-Nitroso-di-n-Propylamine				4 U	1 U		
Hexachloroethane				8 U	2 U		
Nitrobenzene				4 U	1 U		
Isophorone				3.0 J	1.7 J		
2-Nitrophenol				20 U	5 U		
2,4-Dimethylphenol				8 U	2 U		
Benzoic Acid				200	12		
Bis(2-Chloroethoxy)Methane				4 U	1 U		
2,4-Dichlorophenol				12 U	3 U		
1,2,4-Trichlorobenzene				4 U	1 U		
Naphthalene				3.7 J	1 U		
4-Chloroaniline				12 U	3 U		
Hexachlorobutadiene				8 U	2 U		
4-Chloro-3-Methylphenol				8 U	2 U		
2-Methylnaphthalene				4 U	1 U		
Hexachlorocyclopentadiene				20 U	5 U		
2,4,6-Trichlorophenol				20 U	5 U		
2,4,5-Trichlorophenol				20 U	5 U		
2-Chloronaphthalene				4 U	1 U		
2-Nitroaniline				20 U	5 U		
Dimethyl Phthalate				4 U	1 U		
Acenaphthylene				4 U	1 U		
3-Nitroaniline				20 U	5 U		
Acenaphthene				4 U	1 U		
2,4-Dinitrophenol				40 U	10 U		

Trns Blk – transfer blank
Inf – influent to the WTP
Eff – effluent
grab – grab sample
C – composite sample
E – sample collected by Ecology
S – sample collected by Sonoco

U – Indicates compound was analyzed for but not detected at the given detection limit.
J – Indicates an estimated value for a detected analyte.

Appendix D – (cont'd) – Sonoco, June 1992.

Location:	Trns Blnk	Inf–1	Inf–2	Inf–E	Eff–E	Eff–1	Eff–2
Type:	grab	grab	grab	E–comp	E–comp	grab	grab
Date:	6/2	6/2	6/2	6/2–3	6/2–3	6/2	6/2
Time:	1100	1050	1420	1000–1000	1000–1000	1120	1445
Lab Log#:	238080	238081	238082	238083	238089	238087	238088
BNA Compounds	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
4–Nitrophenol				20 U	5 U		
Dibenzofuran				4 U	1 U		
2,6–Dinitrotoluene				20 U	5 U		
2,4–Dinitrotoluene				20 U	5 U		
Diethyl Phthalate				22	1 U		
4–Chlorophenyl Phenylether				4 U	1 U		
Fluorene				4 U	1 U		
4–Nitroaniline				20 U	5 U		
4,6–Dinitro–2–Methylphenol				40 U	10 U		
N–Nitrosodiphenylamine				4 U	1 U		
4–Bromophenyl Phenylether				4 U	1 U		
Hexachlorobenzene				4 U	1 U		
Pentachlorophenol				20 U	0.9 J		
Phenanthrene				4 U	1 U		
Carbazole				4 U	1 U		
Anthracene				4 U	1 U		
Di–n–Butyl Phthalate				12	1 U		
Fluoranthene				4 U	1 U		
Pyrene				4 U	1 U		
Butylbenzyl Phthalate				4.8 J	1 U		
3,3'–Dichlorobenzidine				20 U	5 U		
Benzo(a)Anthracene				4 U	1 U		
Bis(2–Ethylhexyl)Phthalate				17	2.5		
Chrysene				4 U	1 U		
Di–n–Octyl Phthalate				4 U	1 U		
Benzo(b)Fluoranthene				4 U	1 U		
Benzo(k)Fluoranthene				4 U	1 U		
Benzo(a)Pyrene				4 U	1 U		
Indeno(1,2,3–cd)Pyrene				4 U	1 U		
Dibenzo(a,h)Anthracene				4 U	1 U		
Benzo(g,h,i)Perylene				4 U	1 U		

Appendix D – (cont'd) – Sonoco, June 1992.

Location:	Trns Blnk	Inf–1	Inf–2	Inf–E	Eff–E	Eff–1	Eff–2
Type:	grab	grab	grab	E–comp	E–comp	grab	grab
Date:	6/2	6/2	6/2	6/2–3	6/2–3	6/2	6/2
Time:	1100	1050	1420	1000–1000	1000–1000	1120	1445
Lab Log#:	238080	238081	238082	238083	238089	238087	238088
Pesticide/PCB Compounds	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
alpha–BHC				0.10 U	0.10 U		
beta–BHC				0.05 U	0.05 U		
delta–BHC				0.60 U	0.50 U		
gamma–BHC (Lindane)				0.09 U	0.05 U		
Heptachlor				0.05 U	0.05 U		
Aldrin				0.05 U	0.10 U		
Heptachlor Epoxide				0.05 U	0.05 U		
Endosulfan I				0.05 U	0.05 U		
Dieldrin				0.10 U	0.10 U		
4,4'–DDE				0.10 U	0.10 U		
Endrin				0.10 U	0.10 U		
Endosulfan II				0.10 U	0.10 U		
4,4'–DDD				0.10 U	0.10 U		
Endosulfan Sulfate				0.10 U	0.10 U		
4,4'–DDT				0.10 U	0.10 U		
Methoxychlor				0.50 U	0.50 U		
Endrin Ketone				0.10 U	0.10 U		
Endrin Aldehyde				0.10 U	0.10 U		
gamma–Chlordane				0.05 U	0.05 U		
alpha–Chlordane				0.08 U	0.05 U		
Toxaphene				5.0 U	5.0 U		
Aroclor–1242/1016				1.0 U	1.0 U		
Aroclor–1248				1.0 U	1.0 U		
Aroclor–1254				1.0 U	1.0 U		
Aroclor–1221				2.0 U	2.0 U		
Aroclor–1232				1.0 U	1.0 U		
Aroclor–1260				1.0 U	1.0 U		

Trns Blk – transfer blank
Inf – influent to the WTP
Eff – effluent
grab – grab sample
comp – composite sample
E – sample collected by Ecology
S – sample collected by Sonoco

U – Indicates compound was analyzed for but not detected at the given detection limit.

Appendix D – (cont'd) – Sonoco, June 1992.

Metals	Hardness = 320	Trns Blnk grab 6/2 1100 238080 ug/L		Inf–1 grab 6/2 1050 238081 ug/L	Inf–2 grab 6/2 1420 238082 ug/L	Inf–E E–comp 6/2–3 1000–1000 238083 ug/L		Eff–E E–comp 6/2–3 1000–1000 238089 ug/L		Eff–1 grab 6/2 1120 238087 ug/L	Eff–2 grab 6/2 1445 238088 ug/L
Aluminum		20	UN			5310	N	1080	N		
Antimony		30	U			30	U	30	U		
Arsenic		1.5	U			4.1	P	4.4	P		
Pentavalent											
Trivalent											
Beryllium		1.0	U			1.0	U	1.0	U		
Cadmium		0.10	U			1.09		0.34	P		
Chromium		5.0	U			6.3	P	5.0	U		
Hexavalent											
Trivalent											
Copper		3.0	U			35.8		7.9	P		
Lead		1.0	U			18.0		4.6	P		
Mercury		0.050	U			0.28	P	0.084	P		
Nickel		10	U			11	P	11	P		
Selenium		2.0	U			2.0	U	5.0	P		
Silver		0.50	UJ			0.50	UJ	0.50	UJ		
Thallium		2.5	U			2.5	U	2.5	U		
Zinc		4.0	U			270		76.3			

Trns Blk – transfer blank
Inf – influent to the WTP
Eff – effluent
grab – grab sample
C – composite sample
E – sample collected by Ecology
S – sample collected by Sonoco

U – Indicates the analyte was not detected at or above the reported result.
UJ – Indicates the analyte was not detected at or above the reported estimated result.
N – Indicates the spike sample recovery is not within control limits.
P – Indicates the analyte was detected above the instrument detection limit.

Appendix E – VOA and BNA Scan Tentatively Identified Compounds (TICs) – Sonoco, June 1992.

TIC data are presented on the laboratory report sheets that follow.
Locations corresponding to the Lab Log# (appearing as sample number on the laboratory report sheets) and data qualifiers are summarized on this page.

Location:	Inf–1	Inf–2	Eff–1	Eff–2	Inf–E	Eff–E
Type:	grab	grab	grab	grab	E–comp	E–comp
Date:	6/2	6/2	6/2	6/2	6/2–3	6/2–3
Time:	1050	1420	1120	1445	1000–1000	1000–1000
Lab Log#:	238081	238082	238087	238088	238083	238089

E – Ecology composite sample
Inf – influent
Eff – final effluent

J – indicates an estimated value for a detected analyte.

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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: 238081

Lab ID: A848C
Matrix: Waters

QC Report No: A848 - WDOE
Project No: Sonoco
Date Received: 06/04/92

Data Release Authorized: _____
Prepared 06/24/92 - MAC:B sdrd

	CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration (µg/L)
1	-	UNKNOWN (bp m/e 45)	VOA	414	6 J
2	-	UNK Hydrocarbon (bp m/e 43)	"	1624	6 J
3	-	Alkylbenzene isomer (C10.H14)	"	1652	7 J
4	-	Alkylbenzene isomer (C10.H14)	"	1692	6 J
5	-	Alkylbenzene isomer (C10.H14)	"	1702	6 J
6	-	Alkylbenzene isomer (C10.H14)	"	1750	8 J
7	-	Alkylbenzene isomer (C10.H14)	"	1758	11 J
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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: 238082

Lab ID: A848D
Matrix: Waters

QC Report No: A848 - WDOE
Project No: Sonoco
Date Received: 06/04/92

Data Release Authorized: _____
Prepared 06/24/92 - MAC:B sdrd

	CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration (µg/L)
1	-	UNKNOWN (bp m/e 45)	VOA	413	11 J
2	-	UNK Hydrocarbon (bp m/e 43)	"	685	11 J
3	-	UNK Hydrocarbon (bp m/e 43)	"	1626	9 J
4	-	Alkylbenzene isomer (C10.H14)	"	1654	6 J
5	-	Alkylbenzene isomer (C10.H14)	"	1703	7 J
6	-	UNK Hydrocarbon (bp m/e 43)	"	1754	11 J
7	-	Alkylbenzene isomer (C10.H14)	"	1759	10 J
8	-	Dihydro-methyl-indene isomer	"	1832	5 J
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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: 238087

Lab ID: A848E
Matrix: Waters

QC Report No: A848 - WDOE
Project No: Sonoco
Date Received: 06/04/92

Data Release Authorized: _____
Prepared 06/24/92 - MAC:B sdrd

	CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration (µg/L)
1	-	No UNKNOWNs >10% IS peak height	VOA	-	-
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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: 238088

Lab ID: A848F
Matrix: Waters

QC Report No: A848 - WDOE
Project No: Sonoco
Date Received: 06/04/92

Data Release Authorized: _____
Prepared 06/24/92 - MAC:B sdrd

	CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration (µg/L)
1	-	No UNKNOWNs >10% IS peak height	VOA	-	-
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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: 238083

Lab ID: A848-A
Matrix: Waters

QC Report No: A848-WDOE
Project No: Sonoco

Data Release Authorized:

Date Received: 06/04/92

Report prepared: 06/25/92 - MAC: A rpr

	CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration (µg/L)
1	-	C6.H120 isomer coelute (bp m/e 45)	ABN	456	120 J
2	149-57-5	Hexanoic Acid, 2-Ethyl	"	701	55 J
3	-	Ethanol,(2-Butoxyethoxy) isomer	"	779	93 J
4	-	Benzaldehyde,Hydroxy-Methoxy isomer	"	1018	150 J
5	-	Unknown (bp m/e 43)	"	1027	53 J
6	-	Benzenebutanoic Acid,Dimethyl isomer coelute	"	1177	53 J
7	615-22-5	Benzothiazole,2-(Methylthio)	"	1224	200 J
8	134-96-3	Benzaldehyde,4-Hydroxy-3,5-Dimethoxy-	"	1271	120 J
9	-	Unknown (bp m/e 151)	"	1289	100 J
10	-	Unknown (bp m/e 55)	"	1645	130 J
11	-	Unknown Hydrocarbon (bp m/e 57)	"	1686	160 J
12	-	Unknown Hydrocarbon (bp m/e 57)	"	1754	330 J
13	-	Unknown Hydrocarbon (bp m/e 57)	"	1820	410 J
14	-	Unknown Hydrocarbon (bp m/e 57)	"	1883	470 J
15	-	Unknown Hydrocarbon (bp m/e 57)	"	1944	390 J
16	-	Unknown Hydrocarbon (bp m/e 57)	"	2003	270 J
17	-	Unknown Hydrocarbon (bp m/e 57)	"	2059	330 J
18	-	Unknown Hydrocarbon (bp m/e 57)	"	2114	240 J
19	-	Unknown Hydrocarbon (bp m/e 57)	"	2167	150 J
20	-	Unknown Hydrocarbon (bp m/e 57)	"	2218	150 J
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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: 238083

Lab ID: A848-A re
Matrix: Waters

QC Report No: A848-WDOE
Project No: Sonoco

Data Release Authorized: *Dana B. Pitt*
Report prepared: 06/25/92 - MAC: A rpr

Date Received: 06/04/92

	CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration (µg/L)
1	-	Unknown (bp m/e 57)	ABN	412	98 J
2	-	C6.H12.0 coeluted isomer (bp m/e 45)	"	456	150 J
3	149-57-5	Hexanoic Acid, 2-Ethyl	"	708	65 J
4	55724-73-7	Butanoic Acid, 4-Butoxy	"	990	51 J
5	-	Benzaldehyde,Hydroxy-Methoxy isomer	"	1017	140 J
6	-	Unknown (bp m/e 43)	"	1025	54 J
7	615-22-5	Benzothiazole,2-(Methylthio)	"	1221	120 J
8	306-08-1	Benzeneacetic Acid, 4-Hydroxy-3-Methoxy-	"	1258	55 J
9	134-96-3	Benzaldehyde, 4-Hydroxy-3,5-Dimethoxy-	"	1269	79 J
10	-	Unknown (bp m/e 151)	"	1287	53 J
11		C20.H34.0 Isomer (bp m/e 55)	"	1601	57 J
12	-	Unknown Hydrocarbon (bp m/e 57)	"	1683	99 J
13	-	Unknown Hydrocarbon (bp m/e 57)	"	1752	210 J
14	-	Unknown Hydrocarbon (bp m/e 57)	"	1818	260 J
15	-	Unknown Hydrocarbon (bp m/e 57)	"	1881	290 J
16	-	Unknown Hydrocarbon (bp m/e 57)	"	1942	220 J
17	-	Unknown Hydrocarbon (bp m/e 57)	"	2000	160 J
18	-	Unknown Hydrocarbon (bp m/e 57)	"	2057	120 J
19	-	Unknown Hydrocarbon (bp m/e 57)	"	2111	87 J
20	-	Unknown Hydrocarbon (bp m/e 57)	"	2164	54 J
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ORGANIC ANALYSIS DATA SHEET - Tentatively Identified Compounds

Sample No: 238089

Lab ID: A848-B re
Matrix: Waters

QC Report No: A848-WDOE
Project No: Sonoco

Data Release Authorized: Dana B. Litke
Report prepared: 06/25/92 - MAC: A rpr

Date Received: 06/04/92

	CAS Number	Compound Name	Fraction	Scan Number	Estimated Concentration (µg/L)
1	-	Unknown (bp m/e 59)	ABN	561	26 J
2	-	Dehydromevalonic Lactone/coelute	"	577	24 J
3	149-57-5	Hexanoic Acid, 2-Ethyl	"	707	17 J
4	-	C7.H5.N.S isomer	"	826	32 J
5	20324-33-8	2-Propanol,1-(2-(2-Methoxy-1-Methylethoxy	"	895	24 J
6	20324-33-8	2-Propanol,1-(2-(2-Methoxy-1-Methylethoxy	"	899	34 J
7	-	Unknown (bp m/e 59)	"	916	32 J
8	-	Unknown (bp m/e 73)	"	919	14 J
9	13343-981	Butane,1-(2-Methoxyethoxy)-	"	995	33 J
10	-	Benzaldehyde,Hydroxy Methoxy isomer	"	1018	16 J
11	-	Unknown (bp m/e 43)	"	1029	72 J
12	615-22-5	Benzothiazole,2-(Methylthio)	"	1226	460 J
13	-	Unknown Hydrocarbon/coelute (bp m/e 57)	"	1685	27 J
14	-	Unknown Hydrocarbon (bp m/e 57)	"	1753	41 J
15	-	Unknown Hydrocarbon (bp m/e 57)	"	1819	43 J
16	-	Unknown (bp m/e 133)	"	1831	82 J
17	-	Unknown (bp m/e 57)	"	1882	57 J
18	-	Unknown Hydrocarbon (bp m/e 57)	"	1943	44 J
19	-	Unknown Hydrocarbon (bp m/e 57)	"	2001	35 J
20	-	Unknown Hydrocarbon (bp m/e 57)	"	2058	27 J
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